

## Micro Resistojet for Small Satellites, Phase I

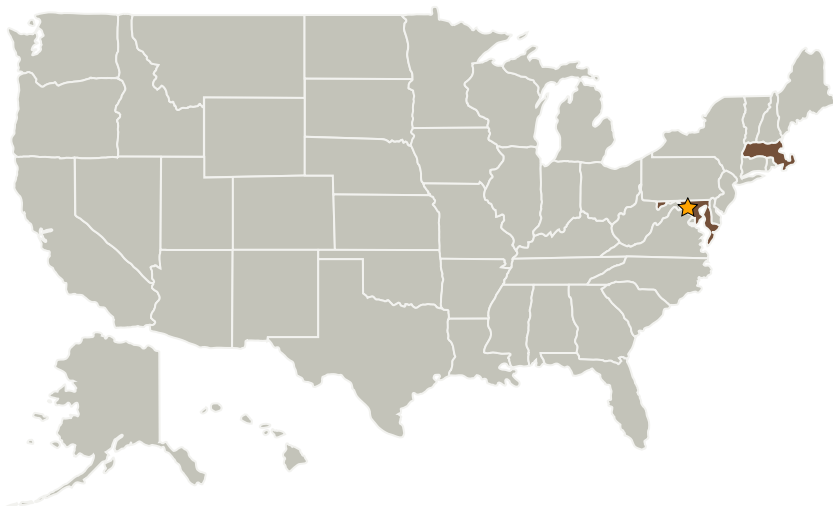
Completed Technology Project (2005 - 2005)



## Project Introduction

Micro-resistojets offer the best combination of simplicity, performance, wet system mass and power consumption for small satellites (<100kg, <50Watts) requiring mN level propulsion and low to moderate deltaV(<500m/sec). Classical competing devices such as cold gas thrusters have low performance, while liquid bipropellants have both high losses in the mN thrust range and are more complex. The advanced EP devices such as colloid thrusters are suitable for sub-mN thrust while electrostatic or electromagnetic thrusters are suitable for large deltaV missions where their higher dry mass is offset by higher specific impulse. Busek therefore proposes to develop a complete micro-resistojet system operating on ammonia or methanol delivering thrust up to 5mN, specific impulse approaching 300sec, impulse bit smaller than 1mNsec and power consumption lower than approximately 10Watts. Ammonia was chosen because it is less toxic than hydrazine while offering similar performance. Methanol is non toxic, greatly simplifying s/c fueling which is especially important for low cost missions. In Phase 1, breadboard system will be constructed and tested on our Maglev thrust stand that can resolve microNewton forces. In Phase 2 an Engineering Model of the system will be developed.

## Primary U.S. Work Locations and Key Partners



Micro Resistojet for Small Satellites, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Goddard Space Flight Center (GSFC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Micro Resistojet for Small Satellites, Phase I

Completed Technology Project (2005 - 2005)



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Busek Company, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Natick, Massachusetts

## Primary U.S. Work Locations

Maryland	Massachusetts
----------	---------------

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Vlad Hruby

## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - └ TX01.1 Chemical Space Propulsion
    - └ TX01.1.8 Warm Gas